Buy U. S. War Savings Bonds and Stamps

GEOGRAPHIC SCHOOL BULLETINS

Published Weekly by

THE NATIONAL GEOGRAPHIC SOCIETY

(The National Geographic Society is a scientific and educational Society, wholly altruistic, incorporated as a non-commercial institution for the increase of geographic knowledge and its popular diffusion. General Headquarters, Washington 6, D. C.)

April 30, 1945. Vol. XXIII. No. 28.

Willard Price

GRANDMOTHER AND GRANDSON COME TO THE FAIR AT HULUN, MANCHURIA

Trade fairs held in this edge-of-the-desert city near the junction of Siberia, Outer Mongolia, and Manchuria attract motley throngs. This Mongol granddame, wearing cheap and nearly useless Japanese spectacles, carries a fat child of the Gobi, letting him see the sights. All his life this lad will ride, graduating from the backs of his womenfolk to his father's ponies (Bulletin No. 1).

SAVE WASTE PAPER

Paper is essential to victory. Save every scrap of it. Your local salvage committee will tell you how waste paper helps win the war.

Buy U. S. War Savings Bonds and Stamps

GEOGRAPHIC SCHOOL BULLETINS

Published Weekly by

THE NATIONAL GEOGRAPHIC SOCIETY

(The National Geographic Society is a scientific and educational Society, wholly altruistic, incorporated as a non-commercial institution for the increase of geographic knowledge and its popular diffusion. General Headquarters, Washington 6, D. C.)

April 30, 1945. Vol. XXIII. No. 28.

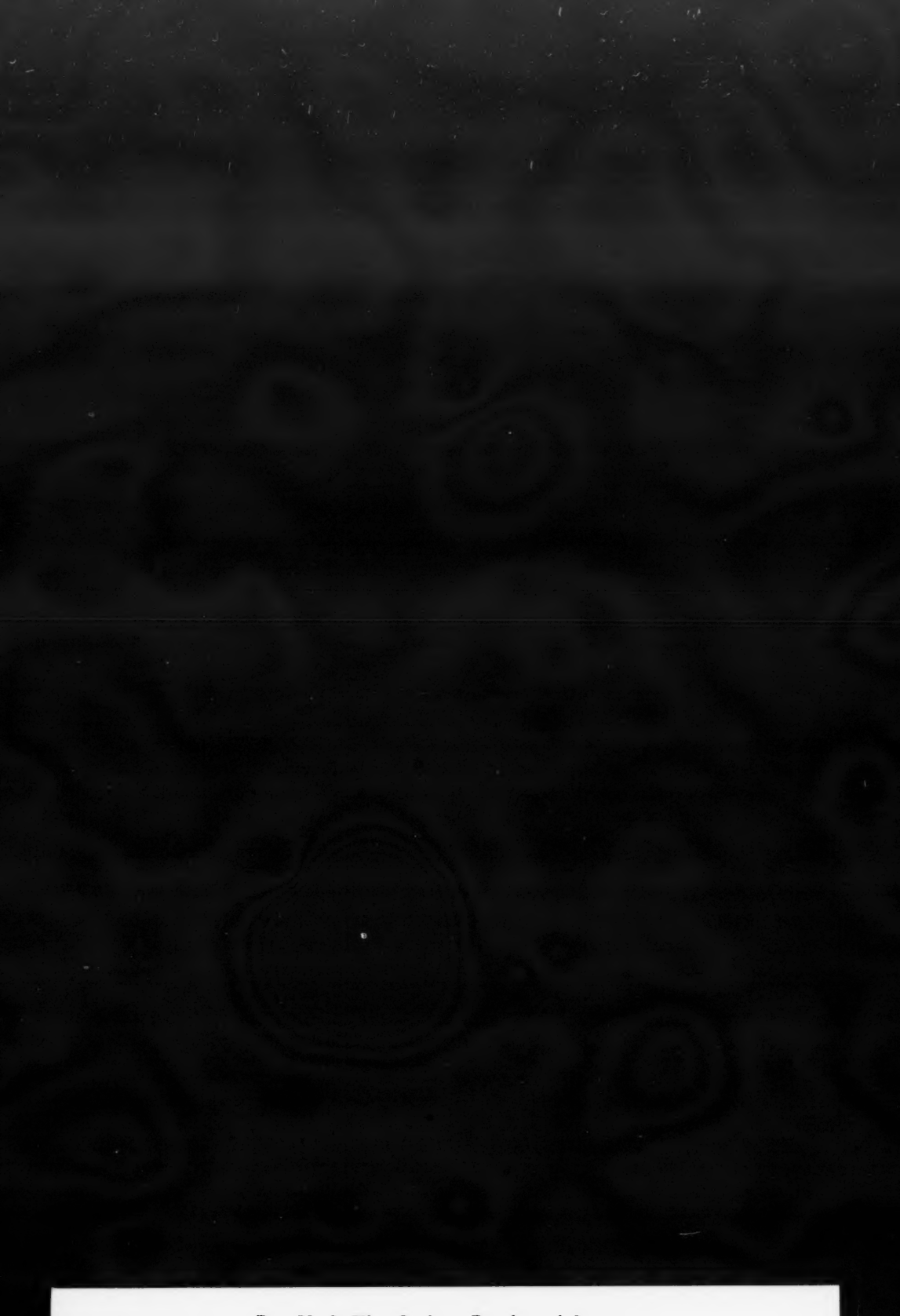
Willard Price

GRANDMOTHER AND GRANDSON COME TO THE FAIR AT HULUN, MANCHURIA

Trade fairs held in this edge-of-the-desert city near the junction of Siberia, Outer Mongolia, and Manchuria attract motley throngs. This Mongol granddame, wearing cheap and nearly useless Japanese spectacles, carries a fat child of the Gobi, letting him see the sights. All his life this lad will ride, graduating from the backs of his womenfolk to his father's ponies (Bulletin No. 1).

SAVE WASTE PAPER

Paper is essential to victory. Save every scrap of it. Your local salvage committee will tell you how waste paper helps win the war.



GEOGRAPHIC SCHOOL BULLETIN

HOW TEACHERS MAY OBTAIN THE BULLETINS

The Geographic School Bulletins are published weekly throughout the school year (thirty issues) and will be mailed to teachers in the United States and its possessions for one year upon receipt of 25 cents (stamps or money order); in Canada, 50 cents. Originally entered as second-class matter January 27, 1922; re-entered as of April 27, 1943, Post Office, Washington, D. C., under Act of March 3, 1879.

Japan-Soviet Far East Border Is Long, Varied, and Explosive

SOVIET denunciation of the 1941 Jap-Soviet non-aggression pact turns the geographic spotlight on the 2,300-mile border separating Nipponese and Soviet territories. This border has twice seen a clash of arms between these Far Eastern adversaries—once in the Russo-Japanese War of 1904-05, again, in the '30's, during a full-dress, but officially ignored border war.

Manchuria, wrested by Japan from China in 1931, furnishes the most critical part of the long border across which Soviet and Japanese forces now face each other in eastern Asia. This territory, set up as the puppet state of Manchukuo, has been described as the foundation stone of Japan's dream empire of the East.

Strange Border War Humiliated Jap Forces

Surrounding this new Japanese state on three sides is the Soviet Far East. On the northwest is the Chita region. On the north are the Amur region and the Jewish Autonomous Province of Khabarovsk territory. On the east where the Maritime Territory reaches far southward, Soviet power, centered around the port of Vladivostok on the Sea of Japan, is less than three flying hours from Tokyo.

On the west, south of Chita, Manchuria is bordered for 300 miles by Outer Mongolia. Since its 1924 revolution, this state has progressed along Soviet lines and worked closely with its Soviet counselors. In northwest Manchuria, near Outer Mongolia, lies Hulun (Hailar), fair city (illustration, cover).

A decade of undeclared warfare between Japan and Russia followed the Jap seizure of Manchuria. It witnessed more than 2,000 armed clashes along the 2,300-mile border from Nomonhan on the Outer Mongolia line to Changkufeng, near Vladivostok. Warlike native tribesmen further agitated the borderlands (illustration, next page).

Soviet opposition to Jap thrusts along the mile-wide Amur River boundary up to mid-1937 was weak. Following this Japan opened war against China at the Marco Polo Bridge near Peiping on July 7 of that year. The situation was altered when a Jap-made border "incident" at Nomonhan in 1939 turned into a humiliating Jap defeat after summer-long warfare engaging air and tank forces. In this strange battle, officially ignored, Japan lost 18,000 of 60,000 troops committed.

Sakhalin Island Divided Between the Two Powers

The border has been kept perpetually alert. Japan acts to guard against the threat to her home islands and to the Manchuria rail line north from Ryojun (Port Arthur) and Dairen to Pinkiang (Harbin), along which abundant coal and iron supports local as well as homeland heavy industries.

The Soviet Union, in turn, guards Vladivostok, where much of the 206,000 population lives and works underground. It watches the city's rail arteries from the west—the original and the alternate trans-Siberian lines, both curving with the border for hundreds of miles. It defends Khabarovsk, Komsomolsk, and Nikolaevsk, port centers of Siberian expansion on the lower Amur River, and Sovetskaya Gavan, rail port on the Maritime Territory coast.

Eastward off the Siberian coast and due north of the Japanese main-group island of Hokkaido, Sakhalin Island, extending 600 miles north to south, is divided in half by the 50th parallel of north latitude. By its victory over Russia in 1904-05, Japan reacquired the southern half of this island which had been ceded to Russia in 1875, and gained petroleum and coal concessions in the Russian half.

Ewing Galloway

MAHANOY CITY, AN ANTHRACITE TOWN IN PENNSYLVANIA: IN THIS BREAKER COAL IS PREPARED FOR COMMERCIAL USE

The breaker cleans, screens, and loads coal into waiting railroad cars. Larger chunks are crushed, then the pieces are sent over a screen through which they drop in the various commercial sizes. First, the coal is washed and separated from dirt and slate in revolving cones. The long conveyors haul this refuse to tops of dump heaps. Anthracite, prized hard coal, is found only in four relatively small fields in northeastern Pennsylvania, 100 miles from New York City. Many states produce bituminous, or soft coal (Bulletin No. 4).

GEOGRAPHIC SCHOOL BULLETIN

Published Weekly by

THE NATIONAL GEOGRAPHIC SOCIETY

(Founded in 1888 for the Increase and Diffusion of Geographic Knowledge)

General Headquarters, Washington 6, D. C.

Captured Essen Was Germany's Pioneer Munitions Center

SOLDIERS of the U. S. Ninth Army, fighting their way into Essen, Germany's pioneer iron and steel center, captured a city that has had a bare century of phenomenal growth. Founded in 852, for nearly a thousand years it remained a sleepy small town huddled around an abbey. The meteorlike rise of Essen to industrial prominence in the 19th century more closely resembles the development of many American cities than the slow growth of most Old World ones.

Before the present war Essen had 660,000 inhabitants—nearly as many as Pittsburgh, Pennsylvania. Blind geologic processes of the Coal Age placed one of the world's greatest coal deposits at the disposal of Machine-Age Essen. The city grew up squarely on the coal field, a few miles north of the Ruhr River. Many coal mine towers rose among the buildings, similar to the oil derricks that sprouted in Oklahoma City.

King Coal Created Krupp's

Coal kept the blast furnaces of the Krupp and other foundries blazing day and night. Iron ore from German mines, but mostly from Sweden and French Lorraine, poured toward Essen in barges over a remarkable river-canal system (illustration, next page) and via railroad. Converted into iron and steel, it helped Germany rearm after that country scrapped the Versailles Treaty.

Business has not been "as usual" during the current war, due to the terrific pounding from the air of Essen's railroads and mills. The city had suffered 30 night bombings before Pearl Harbor, and after the U.S.AAF joined the RAF the Ruhr cities absorbed a double dose of aerial poison—by day and by night.

The great Krupp works, largest factory for cast-steel in Europe, made Essen practically a one-company town. Its rambling plant covered about one-fourth of the city. Essen's residential areas were largely company-built colonies for active and retired workers. During the First World War the Krupp plant employed more than 100,000 men. This figure was probably greatly increased with the preparation for World War II and the maintenance of munitions during the conflict. A century ago, when Krupp's was finally getting on its feet after 40 lean years, it could boast only 122 workmen.

Attracted by the success of Krupp and by the seemingly inexhaustible coal mines, other companies set up shop in Essen. Machine shops, steel foundries, boiler works, and coal mining companies were established. A later development was chemical factories and dyeworks whose raw material also was coal. Woolen goods, beer, and cigars were less warlike manufactures.

First Krupp Cannon Cast in 1847

Essen lay crowded with other Ruhr cities in a flat, unattractive basin blanketed with smoke, crisscrossed by railroads and canals, and deafened by the constant boom and roar of blast furnaces and rolling mills. A between-the-wars traveler described Essen as the sort of place one likes to see—once.

Popular among the pre-RAF sightseers was the tiny 120-year-old original Krupp house. There Friedrich Krupp had laboriously developed his process for steel casting in the early 1800's. Visitors noted the contrast between this modest beginning and the 204-foot-high administration building of the modern works.

The second Krupp, Albert, took over his father's struggling foundry at the

The common border at Sakhalin's waist measures 75 miles along the 50th parallel. With the exception of the tiny stretch of frontier shared mutually by the Soviet Maritime Territory and Korea (Chosen), this Sakhalin border line is the only internationally sanctioned land boundary between Japan and Soviet Russia. Before Japan started on her career of aggression, she was separated from Russia at all points by water. Her seizure of Manchuria has never been recognized by the United States.

Japan's portion of the long island—the southern half—is known as Karafuto. In March, 1944, the Soviets required Japan to relinquish oil and coal concessions in the northern half 26 years ahead of schedule. In the same year they raised the price to Japan for rights to fish in Soviet waters.

To the northeast, the Kamchatka Peninsula, part of gangling Khabarovsk territory, is another Soviet dagger pointed toward Japan. Lying near the end of the United States Aleutian Islands chain, it reaches to within 20 miles of the Japanese Kuril Islands (Chishima Retto), steppingstones to the empire's main islands.

Note: The Japanese-Soviet border is shown on the National Geographic Society's Map of the Union of Soviet Socialist Republics. A price list of maps may be obtained from the Society's headquarters, Washington 6, D. C.

For additional information, see "New Road to Asia," in the *National Geographic Magazine* for December, 1944; "Japan Faces Russia in Manchuria," November, 1942*; and "Here in Manchuria," February, 1933. *(Issues marked with an asterisk are included in a special list of Magazines available to teachers in packets of ten for $1.00.)*

Bulletin No. 1, April 30, 1945.

Willard Price

ARMED AND MOUNTED MONGOLS, DESCENDANTS OF GENGHIS KHAN, ROAM EMBATTLED JAPANESE-SOVIET BORDERLANDS

GEOGRAPHIC SCHOOL BULLETIN

Published Weekly by

THE NATIONAL GEOGRAPHIC SOCIETY

(Founded in 1888 for the Increase and Diffusion of Geographic Knowledge)

General Headquarters, Washington 6, D. C.

Elbe River, German Trade Artery, Fails to Bar Invaders

UNITED States forces in surging across the Elbe, chief waterway of central Germany, passed the last great natural barrier west of Berlin. The river and its tributaries normally carried about one-tenth of the tonnage transported on all the country's inland water routes.

On the Elbe lie Hamburg (illustration, next page), No. 1 port and second-largest city of Germany proper, with 1,682,000 residents; Magdeburg—scene of the first U. S. crossing—ancient fortress town, with a prewar population of 334,000; and Dresden, Saxony's capital, with 625,000 inhabitants.

The Elbe Cuts a Rocky Gorge through Swisslike Scenery

Known to the Romans as the Albis, and to the Czechs as the Labe, the Elbe begins in Czechoslovakia its twisting, 780-mile journey to the North Sea. It rises on the southern slopes of the Snowcap, a peak of the Riesen Gebirge (Giant Mountains) between Silesia and Bohemia. Flowing 50 miles almost due south through Bohemia, it turns sharply to the west for a 40-mile stretch, and then strikes across the frontier northwestward into Germany. It cuts across Saxony and Prussia to the North Sea. Its lower reaches separate the Prussian provinces of Hanover and Schleswig-Holstein.

Outstanding natural features along the upper courses of the river are a deep, rocky gorge piercing the Mittel Gebirge—the mountain barrier between Bohemia and Germany—and the fantastic, weather-sculptured sandstone crags of the "Saxon Switzerland" region. After breaking its way through the mountains, the Elbe runs a placid course through the broad German plain in an endless series of looping curves. Near Hamburg it divides into two sizable streams linked by several small channels. It becomes a single river again beyond the city, sweeping seaward through a broad expanse of marshes.

As the Elbe flows through the Bohemian and German lowlands it picks up several large tributaries. From the east it is fed by the Iser, the Schwarze Elster, the Havel, and the Elde; into it from the west flow the Moldau, the Mulde, and the Saale. Few branches added much traffic to the main river.

Sharp changes in water level have been a handicap to Elbe navigation. In places the passage of even partly loaded craft sometimes becomes difficult. In the lower reaches, sand encroaches on the channel, requiring frequent dredging to maintain depth and width for shipping.

Canals Have Widened the Elbe's Service

Melnik, in Bohemia, about 525 miles upstream from the mouth of the river, was usually regarded as the head of navigation. The Elbe varies strikingly in width through its course: 100 feet at Kolin in Bohemia, 950 feet at Dresden, 1,000 feet at Magdeburg, and four to nine miles from bank to bank at Blankensee, seven miles seaward from Hamburg.

The use of the river was increased by the digging of canals linking it to the Weser and Oder river systems. One hundred canals tie the Elbe in with the Oder network. Tolls were abolished in 1870.

Operating on the Elbe was the largest fleet of Germany's river craft. Barges carrying about 900 tons were standard. The section of Hamburg's port area assigned to river craft was more than half the space provided for seagoing ships.

age of 14, in 1826. For 25 years he played tag with bankruptcy. Recognition and prosperity came after London's Great Exhibition in 1851, where he displayed a mammoth, flawless ingot. He had cast his first cannon four years previously and was already manufacturing many other articles of steel.

By 1865 Albert Krupp had acquired his own sources of raw materials by buying iron and coal mines. The Franco-Prussian War gave him huge orders in ordnance. The subsequent rush of the European countries to out-arm each other boomed the munitions business. The peacetime output included locomotives, box-cars, signal systems, agricultural and industrial machinery, precision instruments, and motor trucks.

Essen's coal miners and factory hands were a stolid, hard-working lot. Even before the war there was no night life—only twilight gatherings for a quiet beer or a made-in-Germany movie. Most of the workers lived in carefully planned, widely spaced "colonies," which, with their stores, parks, and recreation centers, were almost complete units in themselves.

Note: Essen appears on the Society's Map of Germany and Its Approaches.
See also these GEOGRAPHIC SCHOOL BULLETINS: "Ruhr Basin, Arsenal of Nazi Might," October 9, 1944; and "Germany's Rhineland of Prime Military Value," October 2, 1944.

Bulletin No. 2, April 30, 1945.

British Official

CANALS CARRIED FRENCH AND SWEDISH IRON ORE TO ESSEN'S STEEL MILLS

The Rhein-Herne Canal, one of the waterways that traverse Germany's Ruhr basin and helped bring it dominance of European heavy industry, is shown here in an RAF reconnaissance shot. This section of the canal near Essen carries several barges, and others are docked. Different kinds of bridges, as revealed by their shadows, are indicated by letters. Height of structures can be estimated by length of shadows. Such photograph interpretation helped in bombing the target-thick Ruhr.

GEOGRAPHIC SCHOOL BULLETIN

Published Weekly by

THE NATIONAL GEOGRAPHIC SOCIETY

(Founded in 1888 for the Increase and Diffusion of Geographic Knowledge)

General Headquarters, Washington 6, D. C.

Nation's Resources, from Coal to Peanuts, Aid the War Effort

FROM coal to peanuts, none of the world's myriad resources is too obvious or too insignificant for United Nations technicians to fail to bring out its utmost in war-helping possibilities. Coal (illustration, inside cover), of which the United States is the largest producer, is the basic war-making commodity, as it is necessary in the manufacture of steel. Laboratory experiments with peanuts reveal the lowly goober as a source of substitutes for cork and wool.

The role of coal in the Allied war effort lends added interest to the discovery of Virginia coal deposits in 1745, just two hundred years ago. Mined now in 32 states, coal has become the nation's principal source of heat and power.

Coal By-products Add to Its Usefulness

The first American coal mine was at Midlothian, twelve miles west of Richmond. Operations began in 1750. The Richmond basin was mined commercially for more than a hundred years, and still contains coal, but little is now mined.

When Virginia coal production began, eleven colonies had ironworks, using charcoal to produce about 10,000 tons of iron a year, and small amounts of steel. By way of contrast, the present war has increased steel production to about 100 million tons a year. It requires about a ton and a half of coal to make the coke to smelt a ton of pig iron to make steel. Since Pearl Harbor, coke production has exceeded all previous records.

The largest single user of coal, a by-products company, daily converts over 30,000 tons of coal into coke. One day's coke production would require 550 cars to haul it, or a railway train about four miles long.

The war has caused an acute demand for toluol, benzol, phenol, naphthalene, ammonia, and creosote oil—all valuable by-products of coke and essential to the making of explosives and other needed war equipment.

The railways of the country are the industrial arteries over which passes most of the coal to power the machines producing war goods. In tonnage, coal is about a third of all freight shipped by rail (illustration, next page). A steady flow of coal is necessary as the nation's industrial coal pile is always comparatively small. Railways are among the largest users of coal, normally about 100,000,000 tons a year, a fifth of the country's production. By-product coking ovens are next.

Because of poor means of transportation and near-by wood supplies from forests, coal was slow in replacing wood in America. Contrary conditions explain England's early dependence on coal. Virginia's coal mines had not been operating 15 years when they had an exportable surplus, and thousands of bushels were shipped annually to England. As late as 1880 two-thirds of America's homes were still heated with wood.

The Peanut Serves Man in Many Capacities

The peanut, in addition to its newly announced role as the source of ardil, a synthetic fiber of which woollike textiles can be woven, has already offered its hull to the war effort. Science now knows how to convert into "cork" the tons of "waste" hulls which accumulate at factories where peanuts are shelled for market. Ground into a fine meal and milled with a liquid, peanut-hull cork may supplement supplies of natural cork now used in bottle caps, refrigerator linings, wallboards, inner soles, and many other cork needs.

Most of the Elbe's traffic has consisted of a large volume contributed by many small commodities, rather than great bulk from a few products. The reason is that, in its upper reaches, the river is accessible to the forests rimming the Bohemian plateau, with their vast stands of timber; the beet fields in the fertile valleys of the Moldau, Elbe, and Eger rivers which produced great quantities of sugar for export; and industrial towns such as the textile center of Reichenberg, and Gablonz, known for Bohemian glass and costume jewelry. Petroleum bound upstream for Berlin was barged into the Havel and its canal locks.

History was made along the Elbe in earlier wars and invasions. In its middle reaches it has served as a boundary for various political regimes and divisions. Its lower course was used by Teutonic tribes as a line of defense against Slavs and Vikings. Then, as now, the Elbe failed to hold back the invaders, and Hamburg was sacked and burned repeatedly during the ninth century.

Note: The Elbe River is shown on the Society's Map of Germany and Its Approaches. See also, "Hamburg Speaks with Steam Sirens," in the *National Geographic Magazine* for June, 1933; and "German Rivers Form Natural Defense Network," in the GEOGRAPHIC SCHOOL BULLETINS, March 26, 1945.

Bulletin No. 3, April 30, 1945.

Hamburger Luftbild

THIS WAS HAMBURG BEFORE IT WAS PULVERIZED BY ALLIED BOMBS

Before Allied bombs flattened its massive buildings and harbor installations, Hamburg—European port second only to London before the war—was strangely modern in appearance for a city dating back to Charlemagne. Very little remained of the original Hamburg, ancient Hanseatic city. The devastation of many invasions, crowned by a fire which destroyed a quarter of the city a century ago, made way for these modernistic buildings. Chile House, ship-shaped, in the heart of the commercial district, seems to be pushing its sharp prow between two other modern buildings toward the railway in the distance. Built in 1923, this enormous window-spangled structure of vitreous brick housed the offices of the Chilean nitrate interests and other business concerns. Off the starboard bow of Chile House stood Ballin House, also of post-World-War-I design. Gabled buildings at the left were relics of the city's prosperous past —17th and 18th century homes of Hamburg's merchants.

GEOGRAPHIC SCHOOL BULLETIN

Published Weekly by

THE NATIONAL GEOGRAPHIC SOCIETY

(Founded in 1888 for the Increase and Diffusion of Geographic Knowledge)

General Headquarters, Washington 6, D. C.

Geo-Graphic Brevities

BESEIGED BRESLAU WAS EASTERN GERMAN INDUSTRIAL TITAN

BRESLAU, long encircled and by-passed by Soviet forces and reduced to rubble by house-to-house fighting, was the largest and most important city of Germany's eastern border region. Its siege began in January, shortly after the Soviet Army crossed into German territory.

Railways, highways, and a four-lane superhighway lead from the tip of German Silesia nearest Kraków via Breslau to Berlin. The navigable water route down the Oder likewise spans the full distance. German resistance at this transportation center has denied the Soviets full use of southeast German facilities.

Breslau, with a prewar population of 615,000, ranked nip and tuck with Dresden for honors as seventh-largest city of Germany proper. Its excellent position on land transportation routes brought it to prominence not only as the heart of commerce and industry for Silesia but as a center for promotion of international trade. Breslau's gigantic Century Hall and Exhibition Grounds handled the milling thousands who attended trade fairs every fall and spring.

Iron founding, manufacture of railway equipment, machinery, textiles, furniture, and paper kept Breslau commercially in the van of Silesian cities. It is the capital of Lower Silesia. Upper Silesia, Germany's iron, zinc, and lead industrial area up the Oder from the city, fed raw and finished materials of industry to Breslau, while Lower Silesia supplied mainly agricultural products.

From 1939 to early 1944 Breslau proved to be Germany's best located large city for safety against Allied bombing attacks. Part of the Reich government reportedly moved there when blockbusters began dropping on Berlin. The city, dating back nearly 1,000 years, was dotted with old churches and other historic and cultural landmarks. The oldest lay on the left bank of the Oder, grouped about "The Ring," or center square of the town.

Polish at its beginning, the town has known Mongol, Bohemian, Austrian, French, and Prussian control. Napoleon reduced its defenses in 1807, but it revolted in 1813. For those who aided the revolt against Napoleon a new honor was established—the now well-known Order of the Iron Cross.

Note: Breslau is shown on the Society's Map of Germany and Its Approaches.
See also, in the GEOGRAPHIC SCHOOL BULLETINS, March 26, 1945, "German Rivers Form Natural Defense Network," and "Oder River Is Germany's Rhine of the East," February 26, 1945.

* * * * *

IJSSEL MEER, WHERE GERMANS ARE TRAPPED, IS NETHERLANDS' FORMER ZUIDER ZEE

Canadian forces, striking from the lower Rhine (Rhein) bridgehead northwestward across the waist of the Netherlands, and pinning beleaguered German forces against the sea, have brought into news stories the familiar old name, Zuider Zee. That was the name of the broad arm of the North Sea that once reached deep into the heart of the Netherlands.

Today the name will be found only on obsolete maps. In 1932 the Zuider Zee (South Sea) was sealed off by the building of a massive 18-mile-long dam across its mouth. Since then the enclosed body of water has been known as the IJssel Meer (IJssel Lake). The IJssel River empties into the former salt sea and is gradually changing it into a fresh-water lake.

The old Zuider Zee played an intimate part in the life and history of the

Normally all of the cork used in the United States comes from Portugal, Spain, France, Italy, and North Africa. Increased wartime use of cork has multiplied the demand. The Army orders cork for cartridge plugs, bomb parts, and numerous other military needs. The Navy uses it for such things as life preservers and sweat preventers for undersea craft.

Numerous attempts to grow the cork oak tree in America have been made. Experimental plantings have been carried on in California since the 1850's and although strippings from these groves have produced some usable cork, the Mediterranean area still holds first place as the world's producer of the bark.

Peanuts, on the other hand, thrive in the United States from Florida to California and as far north as Washington, D. C. The yield tops two billion pounds a year. Cork oaks take about 20 years to produce their first usable bark.

Peanut shells have been used to some extent as fodder and fuel. Some countries extract a substance from them which is used in certain types of fire-fighting foams. One of the latest uses of the goober's "coat" is in the cleaning of greasy machinery. Ground almost to powder, the peanut "cleaner" is shot through an ordinary sandblast gun to absorb carbon and grease which accumulate in valves, bearings, and other machine parts.

The synthetic fiber, ardil, is made from protein from the nut after industrial oils have been pressed out. The residue makes good cattle feed.

Note: For further information on coal, see "Coal: Prodigious Worker for Man," in the *National Geographic Magazine* for May, 1944.

Bulletin No. 4, April 30, 1945.

Norfolk and Western Railway

ONE CAN NEARLY SMELL COAL DUST AS THE TIPPLE POURS OUT BITUMINOUS

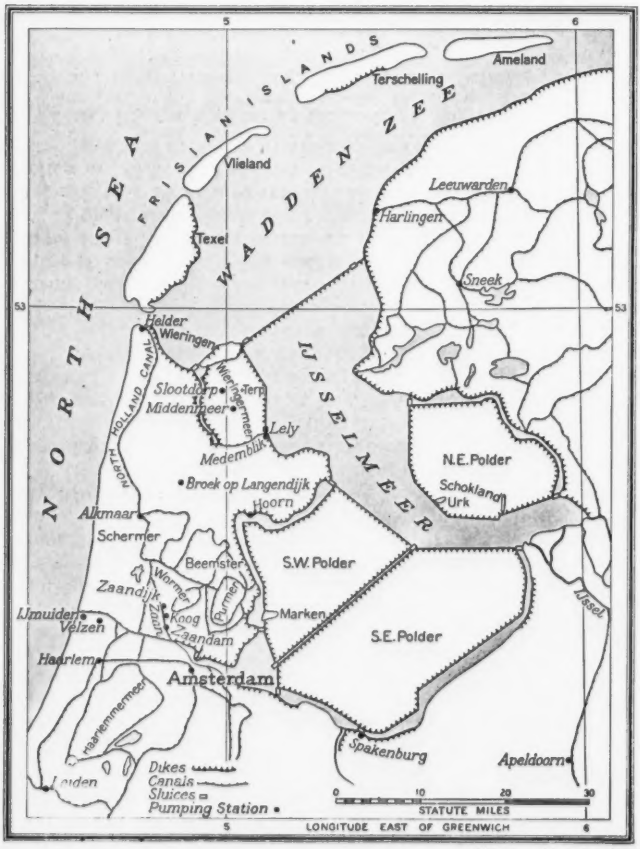
The "mountain mist" over the Appalachian ridge in the background is coal dust raised by the area's mines and tipples. On the right a hillside conveyor brings coal from the mine to the railhead tipple. Shuttling screens separate the dusty bituminous coal into four sizes and drop it into proper cars.

Netherlands. It did not exist before the 12th century, but soon afterward was formed by storms which drove the sea inland and engulfed many fertile areas. Through the centuries Netherlanders tamed their new sea by building dikes around its rim, and put it to use for their commerce.

During the heyday of Dutch sea power in the 17th and 18th centuries, sailing vessels from all the world poked their prows into Zuider Zee waters, bringing wealth to numerous ports along its coasts. Greatest of these was Amsterdam, one of the busiest and most prosperous ports of northern Europe. When ships became too large for the shallow Zuider Zee, Amsterdam turned to the west and in 1876 completed its ship canal to the North Sea. From then on the Zuider Zee carried only a dwindling trade in small ships.

Under Netherlands' engineering plans before the war, the IJssel Meer was to be whittled away by a series of dikes scalloping out from its shores. The enclosed areas or polders were to be pumped out and the reclaimed land turned into farms—a procedure that has given the Netherlands hundreds of thousands of acres of its richest ground.

The highway across the great dam offered the Germans west of the IJssel Meer their only land escape route until Canadians reached the North Sea, trapping all Germans in the Netherlands.



Newman Bumstead

GEOGRAPHY IN THE MAKING IN THE NETHERLANDS

This map shows how Netherlanders were pushing the ocean around before war put a stop to their ambitious reclamation project that will make farmland out of much of the old Zuider Zee bottom. The great dam across the old sea's mouth was completed in 1932. Even before that, but as part of the project, Wieringermeer Polder was snatched from King Neptune's embrace. The other three polders (Southwest, Southeast, and Northeast) were originally planned to be pumped dry and ready for farming in 1950. The diked-off Zuider Zee is now properly called IJssel Meer, as it is a lake (*meer*) fed by the IJssel River. Zuider Zee's historic outlines will be preserved by leaving canals around the edges of the three unfinished polders.

Note: The IJssel Meer is shown on the Society's Map of Germany and Its Approaches.

See also, "Behind Netherlands Sea Ramparts," in the *National Geographic Magazine* for February, 1940*; and "A New Country Awaits Discovery," September, 1933.

Bulletin No. 5, April 30, 1945.